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STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C408

Brief Description: Lower Commissioning exception thresholds.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

Chapter 4 Commercial Energy Efficiency

SECTION C408
SYSTEM COMMISSIONING

C408.1 General. A building commissioning process led by a *certified commissioning professional* and functional testing requirements shall be completed for mechanical systems in Section C403; service water heating systems in Section C404; controlled receptacle and lighting control systems in Section C405; equipment, appliance and systems installed to comply with Section C406 or C407; energy metering in Section C409; and refrigeration systems in Section C410.

Exception: Buildings, or portions thereof, which are exempt from Sections C408.2 through C408.7 may be excluded from the commissioning process.

1. Mechanical systems that are not required to comply with Section C403.3.5 are exempt from the commissioning process where the installed total mechanical equipment capacity is less than 180,000 ~~240.000~~ Btu/h (15-tons) cooling capacity and less than 240,000 ~~300,000~~ Btu/h heating capacity; AND energy recovery ventilation (ERV) equipment is~~: 1) L~~ less than 300 cfm capacity~~, and 2) Not part of a code-required DOAS~~.
2. Service water heating systems are exempt from the commissioning process in buildings where the largest service water heating system capacity is less than 200,000 Btu/h and where there are any of the following: 1) No pools or permanent spas, 2) No solar thermal water heating, 3) No recirculation pumps, and 4) No heat pump water heaters, except fully-packaged for individual residential dwelling unit use.
3. Lighting control systems are exempt from the commissioning process in buildings where both the total installed lighting load is less than 10 ~~20~~ kW and the lighting load controlled by occupancy sensors or *automatic* daylighting controls is less than 5 ~~10~~ kW.
4. Refrigeration systems are exempt from the commissioning process if they are limited to self-contained units.

Purpose of code change:

1. To reduce commissioning exception thresholds, considering more complex and energy-efficient buildings. Specifically:

- HVAC systems continue to be more efficient and simultaneously more complex; this proposal cuts the current two-code cycle Btu/h thresholds for cooling and heating approximately 20%, additionally no exemption for larger ERV and any DOAS equipment, as their additional complexity is often problematic if not commissioned.

- Service water systems are increasingly more complex and often problematic where larger or with networked controls and recirculation pumps; new heat pump water heaters, other than smaller, fully-packed residential, are also often found not working properly if not commissioned.
- Similarly lighting systems continue to be more efficient, especially with now wide-spread LED lighting fixtures, accompanied by ever more complex lighting controls; this proposal cuts the multi-code cycle lighting kW thresholds in half.
- No change to refrigeration system Cx requirements.
- 2. For reference the following summarized HVAC and Lighting Cx thresholds over the last decade of code cycles:

WSEC Year	Heating Threshold	Cooling Threshold	Complexity Threshold
2009	600,000 btu/hr	40 tons (480,000 btu/hr)	None
2012	600,000 btu/hr	480,000 btu/hr (40 tons)	Simple system and no economizer
2015	300,000 btu/hr	240,000 btu/hr (20 tons)	None
2018	300,000 btu/hr	240,000 btu/hr (20 tons)	None
2021 (current draft)	300,000 btu/hr	240,000 btu/hr (20 tons)	None
2021 (proposed)	240,000 btu/hr	180,000 btu/hr (15 tons)	ERV under 300 cfm and no DOAS

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WSEC Year	Total Lighting Power	Automatic Lighting Control	Comments
2009	No threshold	No threshold	All automatic lighting controls commissioned
2012	20 kW	10 kW	None
2015	20 kW	10 kW	None
2018	20 kW	10 kW	None
2021 (current draft)	20 kW	10 kW	None
2021 (proposed)	10 kW	5 kW	50% threshold reduction

Your amendment must meet one of the following criteria. Select at least one:

☐ Addresses a critical life/safety need.

☐ The amendment clarifies the intent or application of the code.

☒ Addresses a specific state policy or statute.
(Note that energy conservation is a state policy)

☐ Consistency with state or federal regulations.

☐ Addresses a unique character of the state.

☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

☐ Single family/duplex/townhome

☐ Multi-family 1 – 3 stories

☒ Multi-family 4 + stories

☒ Commercial / Retail

☒ Institutional

☒ Industrial

Your name	Doug Smith, PE, CCP	Email address	doug@menganalysis.com
Your organization	MENG Analysis	Phone number	425.246.0949

Other contact name Scott Henderson, McKinstry, 206.427.2563 / NW Chapter of the BCxA

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

- Commissioned significant HVAC, service water and lighting controls, and networked controls leads to increased occupant comfort, improved indoor air quality, reduced energy use and lower carbon footprint.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

Typical commercial building commissioning cost is $1/sf, off-set by life cycle energy cost savings of 15% annually; assuming $1/sf for annual energy cost, the simply payback in energy savings alone is 5-years; while improved occupant heath, well-being and resultant productivity increase is harder to measure these additional savings typically reduce the commissioning simply payback period to 2 to 3-years or less.

Show calculations here, and list sources for costs/savings, or attach backup data pages

- Simple energy saving payback = ($1/sf Cx cost) / ($1/sf-yr x 15%) = 7-years
- Assuming occupant productivity cost improvement conservatively equals energy cost saving, cuts simple payback time in half = 7-years x 50% = 3.5-years.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

- See calculations above.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

Code officials will simply enforce current Cx requirements on lower threshold (smaller and/or more complex) buildings.